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Submission to National Review of Mathematical Sciences Research in Australia

Provision of mathematical services

The UNE science faculty has a major emphasis on biological sciences - environmental, agricultural, genetics. There is very little appreciation of mathematics in these cognate disciplines and the biologists are very reluctant to consider the benefits. The mathematicians/statisticians have been proactive in expanding the teaching of mathematics for biology but that has had little impact.

We suggest some reasons for this from our observations.

1. Mathematics is funded inequitably compared to computer science, economics, rural science. This leads to the university discriminating against mathematics.
2. The cognate disciplines did not adapt to the computer revolution beyond Microsoft applications and are not able to adopt the developments in mathematics (applied and theoretical) that accompanied it. Examples of techniques from the past 20 years which are under-utilised in rural and environmental sciences are (i) simulation methods such as MCMC and bootstrap, (ii) non-parametric regression, (iii) wavelets, (iv) chaos. Rather, we now notice a demand from some biologists that equal status be given to defunct techniques on the basis that they are preferred by biologists (without regard to their reliability) and it seems some journals accede to this.

The mathematicians initiated the BMath/BTeach and BSc/BTeach degrees at UNE to contribute to the effort in re-invigorating mathematics and science in high school. However, the course for students in these programs could comprise a larger component of mathematics and statistics rather than the preference given to teaching subjects.

To maintain income, the university is ever ready to enrol poor students and maths training is a casualty. The majority of our students have inadequate high school mathematics to allow them to effectively exploit their strengths in their preferred disciplines. Our large units are remedial mathematics and statistics. Computer scientists and physicists have reduced mathematics pre-requisites for their students and are teaching topics in

second and third year units which are covered in first year mathematics. Computer science and physics students are not encouraged to take supporting mathematics units.

Maths research

UNE places a large emphasis on \$'s and the numbers of papers published. Mathematics academics are penalised by not being in position to attract large grants compared with the Experimental sciences. Our faculty management uses this basis to perceive us as non-contributors to research productivity.

The different discipline norms for numbers of publication are not taken into consideration in evaluating research.

The pool of emerging students is not mathematically strong and we do not envisage changes soon.

Infrastructure

We note 2 instances where the Australian system differs from our overseas competitors and reduces our potential to attract international postgraduate students.

1. The North American system includes positions for teaching assistants which are a source of income for international students. Without these positions, we are disadvantaged in attracting overseas postgraduate students.
2. Our grant funding differs from that in Canada where money is disbursed more widely. Under that system, we could support more postgraduate students.

Bea Bleile	Mathematics
Imi Bokor	Mathematics
Gary Bunting	Mathematics
Yihong Du	Mathematics
Bernard Ellem	Statistics
Adam Harris	Mathematics
Bob Murison	Statistics
Jackie Reid	Statistics
Gerd Schmalz	Mathematics
Shusen Yan	Mathematics